

REMARKS

Claims 1 to 29 are all the claims pending in the application, prior to the present Amendment.

The Examiner has not acknowledged applicants' claim for foreign priority and has not acknowledged receipt of the certified copies of the priority documents. Applicants request the Examiner to make such acknowledgements.

With respect to the restriction requirement and applicants' election of Group II, the Examiner states that he inadvertently included claim 29 in Group II. The Examiner states that claim 29 properly should have been listed as a separate species of Group III.

The Examiner states that since applicants elected Group II, claims 1-6 and the elected article of Group III, claims 14 and 15, will be examined with Group II. Thus, the Examiner states that claims 1-15 are being examined.

Claims 2, 3 and 4 have been rejected under the second paragraph of 35 U.S.C. § 112 as indefinite.

The Examiner states that the recitation "metal halide" in claims 2, 3 and 4 lacks sufficient antecedent basis.

In response, applicants have amended the term "metal halide" in claims 2, 3, and 4 to read -- gaseous titanium halide and gaseous silicon halide --. These terms appear in claim 1 which thus provides antecedent basis for these terms.

In view of the above, applicants request withdrawal of this rejection.

Claims 1-15 have been rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative under 35 U.S.C. § 103(a) as obvious over the newly cited U.S. Patent 7,347,986 to Ishii et al.

Applicants submit that Ishii et al do not disclose or render obvious the subject matter of the present claims and, accordingly, request withdrawal of this rejection.

The present invention as set forth in claim 1 as amended above is directed to a process for producing titania-silica mixed crystal particles having a high bulk density and comprising titanium oxide as the main component and silicon oxide as a subsidiary component. The process comprises decomposing gaseous titanium halide and gaseous silicon halide each heated at 600°C or more in the presence of oxygen or water vapor heated at 600°C or more to obtain a powder comprising titanium oxide and silicon oxide, heating the obtained powder at 300 to 600°C to decrease the concentration of raw material-originated hydrogen halide in the powder to 1 mass% or less, and then subjecting the powder to a stirring treatment of charging the powder into a vessel having a plurality of rotary blades differing in shape and rotating the rotary blades at a peripheral speed of 4 to 60 m/s, to dissociate an aggregated or steric structure of the powder. The powder obtained has a BET specific surface area of 10 to 200 m²/g and a bulk density of 0.15 g/cm³ to less than 0.8 g/cm³ and an oil absorption amount of less than 1 ml/g as measured by the oil absorption measuring method of JIS K 5101 using squalane in place of linseed oil.

Thus, applicants have amended claim 1 to incorporate recitations from claims 5, 7 and 13. Applicants have canceled claims 5 and 13.

In essence, the Examiner states that Ishii et al disclose all of the recitations of the present claims, except for the bulk density recited in claim 7. The Examiner argues that since Ishii et al disclose the same method as set forth in the present invention, the mixed crystals of Ishii et al appear to be identical to those of the present claims or at least obvious thereover.

In response, Ishii et al disclose a vapor phase method for producing titania-silica mixed crystal oxide particles by decomposing a mixed gas of metal halides in the presence of oxygen, where the mixed gas and the oxygen are each heated to a temperature of more than 500°C, preferably more than 650°C, such as the more than 1,000°C employed in Example 3 of Ishii et al, and after cooling, then heating the obtained powder at a temperature of 500°C to perform desalting.

Ishii et al then coat the mixed crystal oxide with a silica coating, which is not done in the present invention, and then dry the particles. Ishii et al disclose at claim 14, lines 12-28, that in the case where aggregations of particles occurs by the drying, the aggregated silica-coated mixed crystal oxide may then be ground to break up the aggregate. The grinding can be effected by a jet mill, a high-speed rotary mill or the like.

Ishii et al do not teach dissociation of an aggregated or steric structure of the titania-silica mixed oxide powder, prior to and even after the silica coating. Dissociation of an aggregated or steric structure is the essential feature of the present invention.

The grinding of Ishii et al is different from the dissociation treatment of the present invention.

The dissociation treatment of the present invention, as set forth in claim 1 as amended above, is a stirring treatment of charging the powder into a vessel having a plurality of rotary blades differing in shape and rotating the rotary blades at a peripheral speed of 4 to 60 m/s. By this dissociation treatment, the original primary particle size is maintained, but the aggregated or steric structure of the powder is removed.

However, if a grinding is effected as in Ishii et al, the original primary particles of Ishii et al are pulverized and the particle size and particle size distribution are changed.

In Ishii et al, agglomerated particles are formed in a silica coating at a drying stage thereof. Therefore, in Ishii et al, to pulverize the agglomerated particles, grinding is conducted.

The agglomerated particles that form in the silica coating at the drying stage of Ishii et al have a considerably high bonding force and, as a result, the particle size distribution in Ishii et al has been substantially changed after the drying.

Therefore, changing the particle size and the particle size distribution of the agglomerated particles requires a large pulverizing or grinding force, which is attained by jet milling in the working Examples of Ishii et al.

In this grinding or pulverizing treatment in Ishii et al, the particle size and the particle size distribution were changed, and even chipping or pulverization of the primary particles is considered to have occurred.

Thus, the grinding or pulverizing treatment in Ishii et al is essentially different from the dissociation treatment of the present invention.

In the present invention after production of the titania-silica mixed crystal oxide, a dissociating treatment is conducted to obtain titania-silica mixed oxide without aggregated or

steric structure of the powder, by which the powder has a BET specific surface area of 10 to 200m²/g, a bulk density of 0.15 g/cm³ to less than 0.8g/cm³, and an oil absorption amount of less than 1 ml/g and is excellent for a cosmetic purpose and other applications.

As can been seen from the above discussion, Ishii et al do not teach the present invention at all.

The Examiner has noted that Ishii et al at column 15, lines 3-19 disclose the use of a Henschel mixer.

However, Ishii et al use the Henschel mixer to mix the silica-coated mixed crystal oxide particles with a chemical, namely, a hydrophobicity imparting agent, to provide a surface treatment on the silica-coated mixed crystal oxide particles. This treatment is different from the dissociating treatment by using a Henschel mixer in the present invention.

Further, in Ishii et al, the silica-coated mixed crystal oxide powder can be subjected to a surface treatment in an organic solvent (wet condition), so that the resultant powder must be aggregated because of the wet treatment.

Thus, the silica-coated mixed crystal oxide powder of Ishii et al is essentially different from the titania-silica mixed crystal oxide powder of the present invention, and Ishii et al do not teach or suggest the present invention at all.

In view of the above, applicants submit that Ishii et al do not disclose or render obvious the subject matter of the present claims and, accordingly, request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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